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VANGUARD OATS

Origin, Description and Performance

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A Plot of Vanguard 7 at Brandon Experimental Farm, 1938

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VANGUARD OATS—ORIGIN, DESCRIPTION AND PERFORMANCE[1]

J. N. WELSH[2]

INTRODUCTION

The production of oat varieties resistant to stem rust is a problem of major importance. The varieties commonly grown are susceptible to this disease which, reaching epidemic proportions in some seasons and in others occurring in localized areas, causes heavy losses in both Western and Eastern Canada.

Resistant varieties have been available for some time but only two of them have been of economic importance, namely, Anthony and Green Russian. Anthony, which is very susceptible to smut, is not a widely adapted variety, but gives good yields in certain sections. Green Russian, which is grown to some extent in the southern part of Manitoba, is undesirable as it has a small yellow kernel. There is, therefore, a need for rust-resistant varieties of good quality and wide adaptability.

The purpose of the present bulletin is to give the origin and description of a new rust-resistant oat variety, named Vanguard, produced at the Dominion Rust Research Laboratory; and to present data, collected over a period of years from tests conducted at several stations, in which the performance of this variety is compared with those commonly grown in Canada as well as certain other varieties of lesser importance.

ORIGIN

Vanguard is the result of a cross, made in 1926, between the varieties Hajira and Banner. Hajira was obtained from Egypt in 1904 by the South African Department of Agriculture and was brought to America in 1919 by the United States Department of Agriculture. No information is available concerning the origin of the other parent, Banner, except that it was introduced into Canada from the United States in 1890 by the Ontario Agricultural College.

Numerous fourth generation lines of this cross, each of which was the progeny of a bulked third generation line, were given a yield test for the first time in 1929. Bulked lines were used in order to establish, as early as possible, yield tests on the new resistant hybrids. One of the most promising lines was No. 339, which was later named Vanguard, and, although it was the progeny of a bulked third generation line, it was fairly homozygous for most characters. From 1933 onward, while under observation in test plots, seed of this line was increased, and by the time it was released in the spring of 1936, approximately 2,000 bushels of it were available for distribution.

Numerous head selections were made from several seventh generation lines of this cross in 1932, a few of which were given a yield test for the first time in 1935. One of the most promising of these selections was No. 7, a selection out of Vanguard 339, which in addition to being more homozygous was superior to the original in size of kernels and weight per bushel. This strain, which will be referred to throughout this discussion as Vanguard 7, was increased at several of the Experimental Farms, as well as by individual growers, and is now regarded by the Canadian Seed Growers' Association as Registered Stock of the Vanguard variety.

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DESCRIPTION OF VANGUARD 7

In view of the fact that Vanguard 7 has been accepted as the Registered Stock of Vanguard, the following description refers to this selection rather than to the parent variety. Both are botanically similar, except that the selection has the larger kernel. A comparison of the kernel types of Vanguard 7, Banner, Anthony, and Gopher is shown in figures 1, 2, 3, and 4, respectively. Vanguard 7

A plot of Vanguard 7 on the farm of Mr. R. D. Kirkham, Saltcoats, Sask.

and Banner resemble each other somewhat with regard to size, shape, and colour, whereas Anthony appears to have a slightly smaller and darker coloured kernel. Gopher, on the other hand, has a much smaller kernel than the other three varieties.

A description of the general plant characteristics of Vanguard 7 is as follows:—

Panicle—spreading, medium long.

Grain:
- Awns—medium in length.
- Colour—white.
- Length—medium.
- Basal hairs—present.
- Rachilla—medium in length.
- Percentage of hull—low.
- Weight per bushel—medium heavy.

Culms:
- Length—medium.
- Nodes—glabrous.
- Leaf pubescence—absent.
- Strength—good.

Maturity: medium early.

Disease Reaction:
- Stem rust—resistant to the prevailing physiologic races.
- Crown rust—susceptible to all physiologic races.
- Smut—moderately susceptible to both loose and covered smut.

DESCRIPTION OF TESTS

The tests herein reported can be classified into two principal groups, namely, regular co-operative rod row tests and supplementary co-operative rod row tests.

The regular co-operative rod row tests, which are conducted in both Western and Eastern Canada, are so designated because they are carried on in co-operation with the Dominion Experimental Farms, agricultural schools, and private growers. The purpose of these tests is to obtain information, under different conditions, on the new rust-resistant oat hybrids. The tests in Western Canada are conducted by the Cereal Division of the Dominion Rust Research Laboratory, Winnipeg, and are located at several points in Manitoba and Saskatchewan. The tests in Eastern Canada are conducted by the Cereal Division of the Central Experimental Farm, Ottawa, in the Maritime Provinces, Quebec, and Ontario.

The supplementary co-operative rod row tests were initiated in 1936 for the purpose of procuring information, in addition to that obtained from the co-operative rod row tests, on new rust-resistant varieties and one or two promising hybrid lines over a larger area at a greater number of points. Thirty-two such tests were conducted in Manitoba in 1936 in co-operation with the Extension Service of the Manitoba Department of Agriculture, the University of Manitoba, and the United Grain Growers Limited, and in 1937 and 1938 forty tests were operated throughout Manitoba and Saskatchewan in co-operation with the United Grain Growers Limited, and the Crop Testing Plan of associated grain companies. These latter tests, each of which contained six varieties, were located on private farms and were supervised by the local elevator agents.

In the presentation of the results the data for the tests in Western Canada are discussed under two headings, Co-operative Rod Row Tests and Supplementary Co-operative Rod Row Tests, while those for Eastern Canada are discussed under the heading of Co-operative Rod Row Tests, only.

RESULTS OF TESTS IN WESTERN CANADA

CO-OPERATIVE ROD ROW TESTS

Co-operative tests have been conducted in Western Canada since 1933 at Winnipeg, Morden, Brandon, and Solsgirth in Manitoba, and at Indian Head and Scott in Saskatchewan. Since that time additional tests were located in Manitoba at Gilbert Plains in 1935, Portage la Prairie, Silverton, and Swan River in 1938, and at Melfort, Saskatchewan, in 1936. The varieties used for comparative purposes with Vanguard 339 and Vanguard 7 are Anthony, Banner, Gopher, and Rusota (Green Russian C.I. 2343) as they are representative of the varieties that are grown in Manitoba and Saskatchewan. Rusota, which was formerly known as Green Russian (C.I. 2343), is used throughout the text as representative of the Green Russian variety.

In discussing the results, data for disease reaction, maturity, height, strength of straw, weight per bushel, weight per 1,000 kernels, percentage of hull, and yield are treated separately. The yields of the varieties over six- and four-year periods for six localities are given in table 1, and in table 2 a summary is given of all the data referred to above for all stations at which tests were conducted during the years 1935-38.

Disease Reaction

The oat diseases discussed are the three major ones, stem rust, crown rust, and smut.

Stem Rust.—Banner and Gopher are susceptible to stem rust, while the other varieties are resistant. Stem rust was not present at any of the stations in 1933 or 1936, nor at Indian Head or Scott during the years under review.

Crown or Leaf Rust.—All of the varieties under discussion are susceptible to crown rust. In addition to these varieties, the variety Erban, which shows resistance to this disease in Eastern Canada, proved to be susceptible in Western Canada.

Loose and Covered Smut.—The varieties were tested for their smut reaction under both natural and artificial field conditions and all proved to be susceptible to this disease. The data in table 2, however, show that Anthony is more susceptible than the other varieties under natural field conditions.

Maturity

Vanguard 339 and Vanguard 7 mature from three to four days later than Gopher and about three days earlier than Banner, Anthony, and Rusota.

Height in Inches

Vanguard 339, Rusota, and Anthony are medium tall varieties, being slightly shorter than Banner but taller than Vanguard 7 and Gopher. Vanguard 7 is approximately 1 inch shorter than Vanguard 339.

Strength of Straw

Data collected over a period of years show that Gopher is stronger in the straw than the other varieties, while Vanguard 339 and Vanguard 7 are stronger than Anthony, Banner, and Rusota.

Weight per Bushel

Gopher, over a period of years, proved to be superior to the other varieties in weight per measured bushel. Banner and Rusota were inferior to the other varieties in this respect, while Vanguard 339, Vanguard 7, and Anthony weighed slightly less than Gopher.

Weight per 1,000 Kernels

Data on kernel weight, which indicate size of kernel, show that Vanguard 7, Banner, and Anthony, have larger kernels than Vanguard 339, Rusota, and Gopher. Vanguard 339 is, however, superior to Rusota and Gopher in this respect.

Percentage of Hull

Gopher, Rusota, Vanguard 339, and Vanguard 7 have approximately 4 per cent less hull than Banner and Anthony.

Yield

The average yields of the varieties over six- and four-year periods, for six localities, are given in table 1. The yields for the Solsgirth and Gilbert Plains tests were combined and treated as one station because no tests were conducted at Gilbert Plains during 1933 and 1934, and on account of damage by gophers, data were not obtained from the Solsgirth test in 1936 and 1937. Vanguard 339, Banner, Anthony, and Gopher were tested during the years 1933 to 1938, while Rusota was included in the tests for the first time in 1934 and Vanguard 7 in 1935. The four-year averages were calculated, therefore, in order to compare the behaviour of Rusota and Vanguard 7 with the other varieties.

In the tests conducted over a six-year period Vanguard 339 was the highest yielding variety on the average for all stations, yielding approximately two bushels more than Anthony and four bushels more than Banner and Gopher. For the four-year period Vanguard 7 was the highest yielding variety and Banner and Gopher the lowest, while both Vanguard 339 and Rusota, giving practically equal yields, produced slightly higher yields than Anthony.

An analysis of the data in table 1 by stations shows that at Winnipeg, Banner and Gopher produced lower yields than the stem-rust-resistant varieties. Gopher, however, gave much lower yields than Banner, a result which indicates than very early maturing varieties are not suited to Winnipeg conditions. Of the resistant varieties, Vanguard 339, Anthony, and Rusota, which produced approximately equal yields, yielded somewhat more than Vanguard 7. At Morden the early maturing varieties Gopher, Vanguard 7, and Vanguard 339 appear to be better adapted than the later maturing ones, with the exception of Rusota, which gives good yields in that district; Anthony and Banner, which are late maturing, produced lower yields than the other varieties. In the tests conducted at Brandon both Vanguard 339 and Vanguard 7 produced higher yields than the other varieties, a result which indicates that the medium early maturing varieties, in general, appear to be well suited to the conditions in that locality. In the combined Gilbert Plains and Solsgirth tests, Gopher gave lower yields than the other varieties, while Vanguard 339 and Rusota were slightly superior to Vanguard 7, Anthony, and Banner. At Indian Head, Gopher, Vanguard 339, and Vanguard 7 produced higher yields than the other varieties. Over the six-year period Gopher outyielded Vanguard 339 by 2 bushels, while over the four-year period Vanguard 7 gave higher yields than both Gopher and Vanguard 339. At Scott, Vanguard 339 has not yielded as well as the other varieties, a fact which is borne out by the results over both the six- and four-year periods. On the other hand, over the four-year period, Vanguard 7 has outyielded Vanguard 339 and produced as high yields as Banner, the variety that is recommended for that district.

In general, it can be stated that Vanguard 339 yielded well at all stations, except Scott, and that Vanguard 7 produced lower yields than Vanguard 339 at Winnipeg, but was equal to or superior to the latter variety at the other stations.

A summary of the data for all tests that have been conducted from 1935 to 1938, which include the tests at Portage la Prairie, Swan River, and Melfort, is given in table 2. As the data for maturity, height, and other plant characters were previously discussed, the data for yield only will be mentioned, since the averages differ from those in table 1, owing to the inclusion of the data from three additional tests. The data show that although the yield averages differ, the relative yields are approximately the same as in table 1 for the four-year period. Vanguard 7 gave the highest yields and Banner and Gopher the lowest, there being little difference between the yields of Vanguard 339, Rusota, and Anthony.

SUPPLEMENTARY CO-OPERATIVE ROD ROW TESTS

The supplementary tests, as previously mentioned, were conducted in 1936, 1937, and 1938. Yields were obtained from twenty such tests in Manitoba in 1936, from sixteen in Manitoba and six in Saskatchewan in 1937, and from thirteen in Manitoba and thirteen in Saskatchewan in 1938. As the tests in Manitoba were located in the northern, central, and southern parts of the grain-growing areas of the province, they were, for the purposes of discussion, grouped according to these areas. The tests in Saskatchewan were all located in the northern grain-growing regions, consequently the varieties will be discussed with regard to their suitability in that part of the province. The data for the three years' tests are given in table 3.

The summer of 1936 was an unusually dry one, particularly in the central and southern parts of Western Canada. In that year Vanguard 339, Vanguard 7, and Gopher gave higher yields than Banner or Anthony on the average for all tests in Manitoba. In the northern part of the province Vanguard 339 was the highest yielding variety, closely followed by Vanguard 7, the other varieties yielding considerably less. In the central and southern parts of the province, however, Gopher produced the highest yields. The yields in these areas were

much lower than in the northern parts, and the results indicate that Gopher is better suited than the other varieties to areas of limited rainfall. In 1937 and 1938 rainfall was more abundant than in 1936. In both of these years Vanguard 339 gave the highest average yield for all tests in Manitoba, while Gopher gave the lowest yields. Vanguard 7 and Anthony yielded approximately the same in both years, yielding less than Victory in 1937, but more than that variety in 1938. In the northern parts of the province Victory and Anthony, in both years, yielded more than the other varieties, whereas in the central and southern parts Vanguard 339 produced the highest yields. Gopher, in both years, was the lowest yielding variety in all areas.

In the tests conducted in Saskatchewan, Vanguard 339 and Vanguard 7 produced the highest yields in 1937, Anthony giving the lowest yields. In 1938, Vanguard 339 and Vanguard 7 were higher yielding than Victory and Gopher, whereas Anthony, which was the lowest yielding variety in 1937, yielded equally as well as Vanguard 339.

The average results for the three years' tests in Manitoba and the two years' tests in Saskatchewan show that Vanguard 339 and Vanguard 7 were the highest yielding varieties for all tests in both provinces and that Gopher was the lowest yielding variety. In Manitoba, Anthony gave identical yields with Banner and Victory, while in Saskatchewan, Anthony yielded two bushels more than either of the latter two varieties.

RESULTS OF TESTS IN EASTERN CANADA

Tests in Eastern Canada were conducted in the Maritime Provinces, Quebec, and Ontario. In the Maritime Provinces tests were located at the Dominion Experimental Stations at Charlottetown, P.E.I.; Nappan and Kentville, N.S.; and at Fredericton, N.B. Several tests at local points in the three provinces were also conducted.

The tests in Quebec were located at the Dominion Experimental Stations and surrounding areas at Ste. Anne de la Pocatière and Lennoxville, and those in Ontario at the eastern section at local testing points, in the southwestern section at the Harrow Experimental Station and surrounding areas, and in northern Ontario at the Kapuskasing Experimental Station.

At the majority of stations the varieties used with Vanguard 339 for comparative purposes were Alaska and Victory. The new variety Erban produced by the Ontario Agricultural College, and which appears to have some resistance to leaf rust under field conditions in Eastern Canada, has been tested in eastern Ontario since 1936. In the other localities this variety was tested for the first time in 1937 or 1938. In discussing the results of these tests each province will be treated separately. The average yields for all tests from which averages could be calculated are given for each locality in table 4.

Prince Edward Island

Vanguard yielded considerably less than Alaska or Victory on the basis of three tests in 1937, while for the average of five tests in 1938 it yielded as well as Victory and considerably more than Alaska. The average yields for the two years, however, as shown in table 4, indicate that Vanguard may not be as well adapted to this locality as the other varieties.

Nova Scotia

In table 4 the average yields for five tests in 1937 and two tests in 1938 at Nappan shows that Erban yielded four bushels more than Vanguard and that both varieties were higher yielding than Alaska or Victory. Erban, however, is prob-

ably better suited to the conditions at Nappan than Vanguard. At Kentville five tests were conducted in 1938, the results of which show that Erban and Vanguard yielded approximately the same and roughly six bushels more than Victory.

New Brunswick

Three tests were conducted at Fredericton in 1937 and seven local tests in 1938. In the 1937 tests, Alaska, Erban, and Vanguard gave practically identical yields, yielding five bushels more than Victory. In the 1938 tests both Erban and Vanguard were superior to Alaska and Victory, Erban yielding three bushels more than Vanguard. The average yields for the two years' results, as shown in table 4, indicate that Vanguard is not as well suited as the other varieties to the conditions at Fredericton. It should be pointed out, however, that at several testing points in both years, rust was a major factor in lowering the yields of the susceptible varieties, particularly Victory which is late maturing.

Quebec

In the Ste. Anne de la Pocatière area three tests were conducted in 1937 and five in 1938, Erban being included in the 1938 tests only. In the 1937 tests Vanguard yielded four bushels more than Alaska and Victory, while in the 1938 tests Victory yielded two bushels more than Vanguard and Erban, and seven bushels more than Alaska. The average yields for the two years' results, as given in table 4, show that Victory and Vanguard produced similar yields, yielding four bushels more than Alaska. At Lennoxville, Vanguard appears to be much better adapted than Alaska or Victory. In tests conducted by this station in 1936, 1937, and 1938, Vanguard was much superior to the other varieties. Erban was tested for the first time at this station in 1938, and in that year Vanguard outyielded it by seven bushels. In table 4 the average yields for the years 1936 and 1937 only are given, because Erban was not included in the 1936 and 1937 tests and Alaska was eliminated from the 1938 tests.

Ontario

In eastern Ontario, where very close observations were made on the distribution of stem and leaf rust, the results of thirty-five tests over a period of three years, 1936-38, indicate that in fairly large districts represented by the counties Renfrew, Prescott, Glengarry, Hastings, Prince Edward, and a part of Carleton county, Vanguard can be safely recommended in preference to Victory. On the other hand, in other districts in eastern Ontario, namely, Lanark, Grenville, Leeds, Dundas, and Carleton counties, where leaf rust is particularly prevalent, Erban appears to be better adapted. The average yields for the three years' tests, as given in table 4, show that Vanguard yielded six bushels more than Erban and nine bushels more than Alaska and Victory.

In northern Ontario, tests conducted at the Kapuskasing station have demonstrated that early maturity is a major factor in oat production in that area. Therefore Vanguard, although it has produced higher yields than Alaska over a period of three years, as shown in table 4, is not recommended for that district, since it matures one week later than Alaska. Another point worthy of note is that under Kapuskasing conditions, Vanguard has a much higher hull content than Alaska, and furthermore it has been shown that with the hulls removed from the grain, there is no difference in yield between the two varieties.

Three tests were conducted in the southwestern part of Ontario at Harrow in 1938. The results show that Alaska O.A.C. No. 157 was superior to Vanguard and Erban, the latter variety yielding five bushels more than Vanguard.

SUMMARY

The origin and description of Vanguard oats, as well as its performance in comparison with other oat varieties in tests conducted at different points in Western and Eastern Canada are presented.

Vanguard 339 originated from a cross made in 1926 between the varieties Hajira and Banner. It is a medium early maturing variety possessing an open panicle, medium-sized white kernels, thin hull, comparatively strong straw, good yielding ability, and resistance to the prevailing races of stem rust. It is, however, susceptible to crown rust and moderately susceptible to loose and covered smut.

Vanguard 7, which is a selection out of Vanguard 339, is regarded as Registered Stock of the Vanguard variety, and is superior to the original variety in weight per bushel and size of kernel.

In Western Canada Vanguard 339 was the highest yielding variety at six stations over a period of six years. It yielded well at all stations except Scott, where it is not recommended for distribution. Vanguard 7 at the same station, on the other hand, has yielded as well as Banner, the variety that is recommended for that district. Furthermore, over a period of four years at the six stations previously mentioned, it produced higher yields than the other varieties. In other tests conducted over a larger area at a greater number of points both Vanguard strains were higher yielding than Anthony, Victory, or Gopher for the average of all tests over a period of three years in Manitoba, and over a period of two years in northern Saskatchewan.

In Eastern Canada the tests conducted in the Maritime Provinces show that Vanguard was higher yielding than Victory at Nappan, Kentville, and Fredericton, but that it was inferior to Victory at Charlottetown. Erban, on the other hand, gave higher yields than Vanguard at Nappan and Fredericton. In Quebec, Vanguard yielded exceptionally well at Lennoxville, and at Ste. Anne de la Pocatière it yielded equally as well as Victory. In eastern Ontario Vanguard gave the highest average yield for all stations over a period of three years. In this area it is particularly recommended for those districts where stem rust is an important factor, whereas Erban is recommended for areas where leaf rust is prevalent. Vanguard is not recommended for the Kapuskasing area as it is too late in maturing, and as the tests in the south-western part of the province were conducted for one year only, no conclusions can be drawn from the results.

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TABLE 1.—AVERAGE YIELD PER ACRE OF OAT VARIETIES GROWN IN THE WESTERN CO-OPERATIVE TESTS AT SEVEN STATIONS OVER SIX- AND FOUR-YEAR PERIODS

Years Tested	Varieties	Stations						Average for Varieties
		Winnipeg	Morden	Brandon	Solsgirth and Gilbert Plains	Indian Head	Scott	
1933-38	Vanguard 339	56·3	70·2	87·1	53·6	44·1	28·7	56·7
	Anthony	54·5	66·1	82·8	48·8	41·0	30·4	53·9
	Banner	50·6	55·4	80·5	51·4	41·4	33·2	52·1
	Gopher	41·7	70·4	75·9	44·6	46·1	30·3	51·5
1935-38	Vanguard 339	55·9	68·7	84·1	53·4	38·5	28·3	54·8
	Anthony	56·5	64·4	80·1	51·0	35·2	31·6	53·1
	Banner	50·2	52·2	74·9	51·0	35·3	34·4	49·7
	Gopher	39·6	72·7	77·5	41·7	40·1	30·5	50·4
	Rusota	56·8	76·1	76·9	55·0	32·8	33·0	55·1
	Vanguard 7	52·7	76·7	88·3	51·3	43·8	34·0	57·8

TABLE 2.—SUMMARY OF DATA FOR OAT VARIETIES GROWN IN WESTERN CO-OPERATIVE TESTS DURING THE FOUR YEARS 1935-38

Varieties	Days to Mature	Height in Inches	Strength of Straw	* Per Cent Stem Rust	Per Cent Leaf Rust	Average Number of Smutted Heads per row	Per Cent Hull	Weight per 1,000 Kernels	Weight per Bushel	Yield in Bushels
Vanguard 7	82·6	33·3	8·6	0	45	1·6	22·8	24·4	34·2	52·2
Rusota	86·1	34·8	8·1	0	45	2·3	23·0	20·5	33·2	51·9
Vanguard 339	83·4	34·5	8·5	0	45	1·5	23·7	23·4	34·0	49·9
Anthony	87·1	34·8	8·0	0	45	10·9	26·6	24·9	34·6	49·2
Banner	85·7	35·9	8·1	20	70	3·5	26·8	24·3	32·7	47·2
Gopher	79·8	31·3	8·8	10	75	·9	23·9	21·9	35·1	47·2

* Average Winnipeg, Brandon, and Morden.

FIGURE 1.—Typical kernels of Vanguard 7 oats

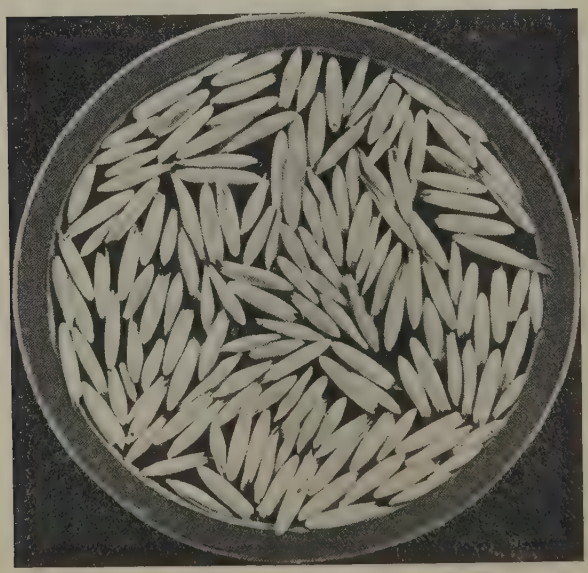

FIGURE 2.—Typical kernels of Banner oats

FIGURE 3.—Typical kernels of Anthony oats

FIGURE 4.—Typical kernels of Gopher oats

TABLE 3.—AVERAGE YIELDS OF OAT VARIETIES GROWN IN THE SUPPLEMENTARY CO-OPERATIVE TESTS AT TWENTY POINTS IN MANITOBA IN 1936 AT SIXTEEN POINTS IN MANITOBA AND SIX IN SASKATCHEWAN IN 1937, AND AT THIRTEEN POINTS IN MANITOBA AND THIRTEEN IN SASKATCHEWAN IN 1938

Years Tested	Varieties	Manitoba			Average for Manitoba	Average for Northern Saskatchewan
		Northern	Central	Southern		
1936	Vanguard 339	61·7	17·2	20·2	33·0	—
	Anthony	50·4	13·4	13·0	25·6	—
	Vanguard 7	58·1	18·7	16·6	31·1	—
	Banner	54·6	15·7	16·0	28·8	—
	Gopher	51·5	25·5	22·5	33·2	—
1937	Vanguard 339	52·5	56·6	57·3	55·5	25·2
	Anthony	56·6	53·1	51·6	53·8	21·5
	Vanguard 7	50·3	56·8	52·1	53·1	25·6
	Victory	56·4	54·7	54·2	55·1	24·1
	Gopher	46·4	48·2	50·2	48·3	24·5
1938	Vanguard 339	44·2	55·2	54·8	51·4	65·1
	Anthony	47·1	50·7	51·4	49·7	65·2
	Vanguard 7	45·2	49·7	49·6	48·2	62·7
	Victory	46·0	43·9	47·8	45·9	59·1
	Gopher	35·4	37·7	39·3	37·5	55·1
Average 3 years	Vanguard 339	52·8	43·0	44·1	46·6	45·2
	Anthony	51·4	39·1	38·7	43·0	43·4
	Vanguard 7	51·2	41·7	39·4	44·1	44·2
	Victory and Banner	52·3	38·1	39·3	43·2	41·6
	Gopher	44·4	37·1	37·3	39·6	39·8

TABLE 4.—AVERAGE YIELDS PER ACRE OF ALASKA, VANGUARD 339, VICTORY, AND ERBAN GROWN IN ROD ROW TESTS IN THE FIVE PROVINCES OF EASTERN CANADA.

Province	Location of Tests	Number of Years Tested	Number of Tests	Varieties			
				Alaska	Vanguard 339	Victory	Erban
Prince Edward Island	Charlottetown	2	8	41·4	40·2	48·8	—
Nova Scotia	Nappan	2	7	51·6	53·8	48·9	57·9
	Kentville	1	5	—	50·9	43·7	49·6
New Brunswick	Fredericton	2	10	48·2	48·7	43·2	50·8
Quebec	Ste. Anne de la Pocatière	2	8	74·4	78·8	78·2	—
	Lennoxville	2	3	55·9	90·4	71·9	—
Ontario	Northern	3	6	61·7	65·9	—	—
	Eastern	3	35	50·5	60·4	50·1	54·1
	Southwestern	1	3	57·9	55·7	—	50·6